active physiologically, but the action differs in kind from that of the simple bases, and resembles the action of natural bases or alkaloids having an approximately similar chemical composition.

7. All the substances examined in this research are remarkable for not possessing any specific paralytic action on the heart likely to cause syncope; but they destroy life, in lethal doses, either by exhaustive convulsions or by gradual paralysis of the centres of respiration, thus causing asphyxia.

8. There is no immediate action on the sympathetic system of nerves, although there is probably a secondary action, because, after large doses, the vaso-motor centre, in common with other centres, becomes involved.

9. There is no appreciable difference between the physiological action of the bases obtained from cinchona and those derived from tar.

The physiological action of the substitution derivatives of these substances will be related in a further communication.

March 4, 1875.

JOSEPH DALTON HOOKER, C.B., President, in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The Right Hon. Sir Stafford H. Northcote was admitted into the Society.

In pursuance of the Statutes, the names of the Candidates for election into the Society were read as follows:—

William de Wiveleslie Abney, Capt. R.E.
William Archer, M.R.I.A.
Edward Middleton Barry, R.A.
James Risdon Bennett, M.D.
Dietrich Brandis, Ph.D.
Charles Orde Browne, Capt. R.A.
George Buchanan, M.D.
Walter Lawry Buller, Sc.D.
James Caird, C.B.
John Casey, LL.D.
William Chimmo, Capt. R.N.
Latimer Clark, F.R.A.S.
Cuthbert Collingwood, M.A.
George Critchett, F.R.C.S.
Herbert Davies, M.D.
August Dupré, Ph.D.
Joseph Fayrer, M.D.
Augustus H. Lane Fox, Colonel.
Francis Stephen Bennet François de Chaumont, M.D.
Alfred Henry Garrod, B.A.
James Geikie, F.R.S.E.
James Whitbread Lee Glaisher, M.A.
Thomas Minchin Goodeve, M.A.
Charles Alexander Gordon, M.D., C.B.
Robert Baldwin Hayward, M.A.
John Baboneau Nickterlien Hennessey, F.R.A.S.
John Hughlings Jackson, M.D.
Emanuel Klein, M.D.
E. Ray Lankester, M.A.

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Squire Thornton Stratford Lecky, Lieut. R.N.R.
Robert M'Lachlan, F.L.S.
Richard Henry Major.
John William Mallet, Ph.D.
George Strong Nares, Capt. R.N.
Robert Stirling Newall, F.R.A.S.
Oliver Pemberton.
David Simpson Price, Ph.D.
William Roberts, M.D.
William Chandler Roberts, F.C.S.
William Rutherford, M.D.
Henry Young Darracott Scott, Major-General, C.B.
Harry Govier Seeley.
Joseph Sidebotham.
John Spiller, F.C.S.
Robert Swinhoe.
George James Symons, V.P.M.S.
Sir Henry Thompson, F.R.C.S.
Thomas Edward Thorpe, Ph.D.
Charles Todd (Obs., Adelaide).
Edwin T. Truman, M.R.C.S.
Wildman Orange Whitehouse, C.E.
Thomas Alexander Wise, M.D.
Archibald Henry Plantagenet Stuart Wortley.
Sir Matthew Digby Wyatt, Knt.

The following Papers were read:—

I. "On the Tides of the Arctic Seas.—Part VI. Tides of Port Kennedy, in Bellot Strait, in July 1859."

By the Rev. Samuel Haughton, M.D. Dublin, D.C.L. Oxon., F.R.S., Fellow of Trinity College, Dublin. Received January 20, 1875.

(Abstract.)

These observations were made on board the yacht 'Fox,' under the command of Sir Leopold M'Clintock, during his successful search for the remains of the Franklin Expedition.

The heights of the tide were observed every hour during 23 days, and the results obtained were extremely interesting.

The tides of Port Kennedy are remarkable for two points:—

1. The magnitude of the diurnal tide.
2. The solar diurnal tide is greater than the lunar diurnal tide.

The following tidal constants have been successfully determined:—

I. DIURNAL TIDE.

Solar Diurnal Tide.

1. Age	Unknown.
2. True Solitidal Interval	$5^h\ 12^m\ 7\frac{1}{2}^s$.
3. Coefficient	23·4 inches.

Lunar Diurnal Tide.

1. Age	$1^d\ 4^h\ 14\frac{1}{2}^m$ (time). 4 6 $20\frac{1}{2}$ (height).
2. True Lunitidal Interval	$0^h\ 33^m\ 50^s$.
3. Coefficient	18·4 inches (time). 23·37 „ (height).

II. SEMIDIURNAL TIDE.

Lunar Semidiurnal Tide.

True Lunitidal Interval............ $23^{h}\ 48^{m}\ 1^{s}$.

$$\left.\begin{array}{r}\text{Uncorrected ratio of Solar and}\\ \text{Lunar Coefficients} \ldots\ldots\end{array}\right\}\frac{S''}{M''}=\left\{\begin{array}{l}0{\cdot}412\text{ inch (height).}\\ 0{\cdot}549\ \ ,,\ \ \text{(time).}\end{array}\right.$$

II. "Note on the Value of a certain Definite Integral." By I. TODHUNTER, M.A., F.R.S., Honorary Fellow of St. John's College, Cambridge. Received February 13, 1875.

Let $P_m(x)$ denote Legendre's coefficient of the order m, and $P_n(x)$ that of the order n: it is required to find the value of $\int_0^1 P_m(x)\,P_n(x)dx$. We need not consider the case in which $m=n$; for it is an established result that the value of the integral taken between the limits -1 and 1 is then equal to $\frac{2}{2n+1}$, and the value between the limits 0 and 1 will be half of this. We suppose now that m and n are different.

It is known that

$$P_m(x)=\frac{1\,.\,3\,.\,5\,.\,.\,(2m-1)}{\underline{|m}}\left\{x^m-\frac{m(m-1)}{2(2m-1)}x^{m-2}+\ldots\right\}, \quad . \quad . \quad (1)$$

and also that

$$\frac{d}{dx}\left\{(1-x^2)\frac{dP_m(x)}{dx}\right\}+m(m+1)\,P_m(x)=0. \quad . \quad . \quad . \quad . \quad (2)$$

Similar expressions, of course, hold for $P_n(x)$.

Now, by a well-known process of integration by parts, we deduce

$$\{m(m+1)-n(n+1)\}\int P_m(x)\,P_n(x)dx$$

$$=\left\{P_m(x)\frac{dP_n(x)}{dx}-P_n(x)\frac{dP_m(x)}{dx}\right\}(1-x^2);$$

this formula can also be immediately verified by differentiation and the use of (2).

Thus

$$\{m(m+1)-n(n+1)\}\int_0^1 P_m(x)\,P_n(x)dx$$

$$=\left\{P_n(x)\,\frac{dP_m(x)}{dx}-P_m(x)\frac{dP_n(x)}{dx}\right\}_{x=0}.$$

If m and n are both even or both odd, the right-hand member of the last formula will vanish by (1); thus the only case we have to consider